



VERIFICATION REPORT

DET NORSKE VERITAS

P-36 INVESTIGATION COMMISSION

Verification by DNV

- Well experienced in major accidents
 - Alexander Kielland, Longford Australia Gas Plant, Kuwait Refinery
- Well experienced in offshore deepwater technology
 - leading Classification Society, safety and risk management
- Not involved in the P-36 rig design or classification
 - independent of design and operation
- Team
 - Dr Robin Pitblado - Houston SHE Management Systems
 - Conn Fagan - Houston Deepwater Unit
 - Gaylen Roberts - Atlanta Management Consulting Unit
 - Eduardo Mezzalira - Rio de Janeiro Manager Offshore Services Center

P-36 Investigation Commission & Competence

- **The Commission**

Carlos HELENO Netto Barbosa

Chairman - Drilling & Logistics Mgr S-SE

Cid Guilherme P Valerio

SMS part of SHE Dept Rio de Janeiro

Ronaldo DIAS

Asset Manager Roncador

Carlos BARTOLOMEU Bastos Barbosa

Mgr Exploitation Basic Engineering CENPES

Jose Antonio de FIGUEIREDO

Mgr Engg Services, Rio de Janeiro

Luiz Carlos Nery GUARABYRA

Mgr HR, Corporate, Rio de Janeiro

Carlos Henrique de Lima Ferreira

Technical Employee, Representative of CIPA

Pedro Jose BARUSCO Filho

Manager within E&P Corporate

Prof Tiago Alberto Piedras Lopes

UFRJ / Coppe Federal Univ at Rio

Mr Antonio Carlos Ferreira Rangel

Union Representative

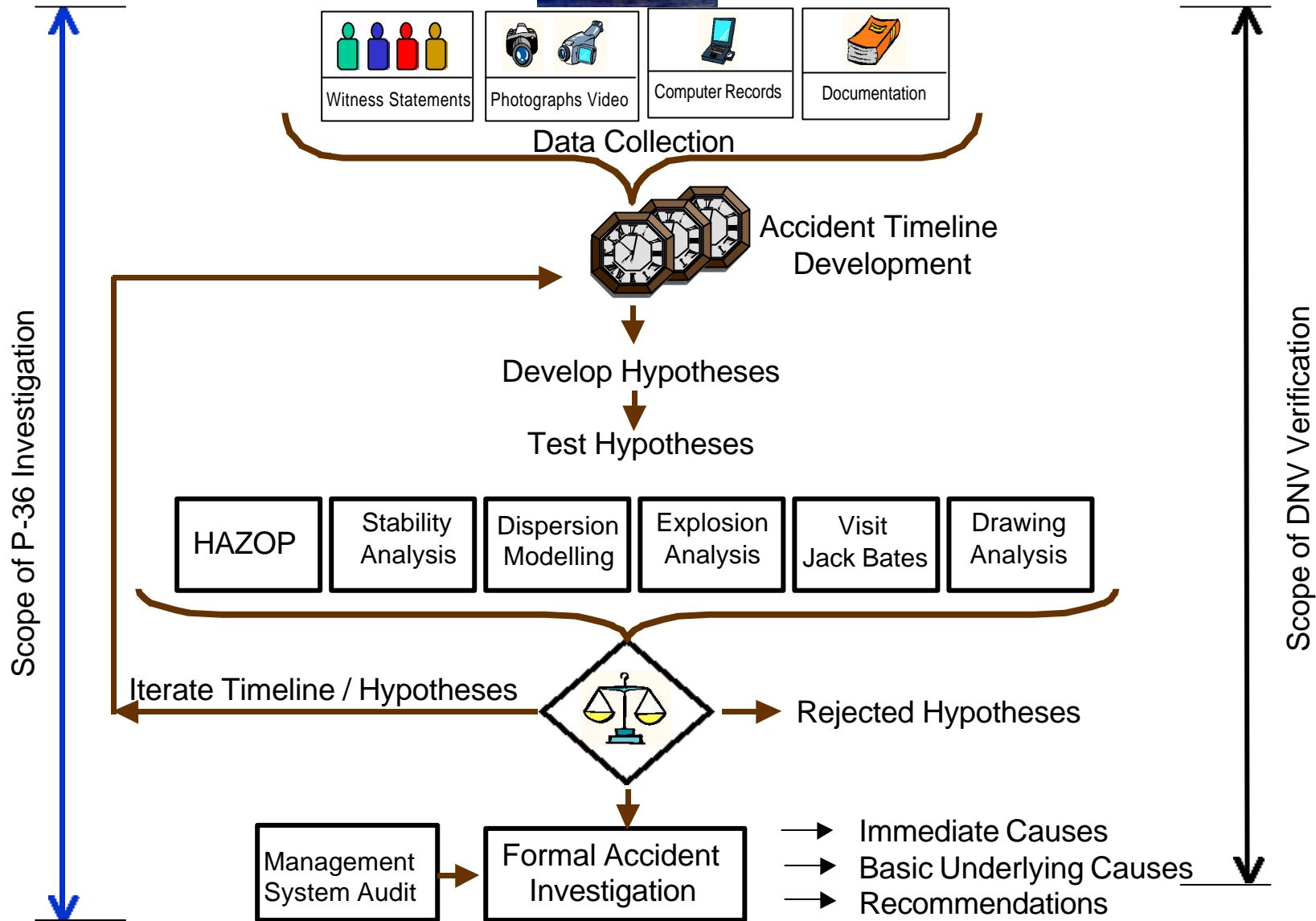
- **DNV comments on composition and competence:**

- team has good balance of senior managers and technical specialists
- employees are represented (Union and CIPA) - this good practice
- University professor (with offshore experience)
- team has experience with investigations - but not major accidents
 - Commission receives briefing in major accident investigation
 - Commission uses external specialists to assist with technical evaluations

The P-36 Investigation



The Accident
15-20 March



Nature of Technical Analyses

- Extensive treatment of data
 - witness information, F&G + ESD records, special 3-d drawings
- Best practice tools
 - gas dispersion by Computation Fluid Dynamics modelling
 - explosion modelling using FLACS - best know offshore code
 - stability analysis using recognized approach
 - HAZOP to test each hypothesis fully
- Extensive external support
 - over 40 engineers contributed to analysis effort
- Team open minded until sufficient data to decide
- Video simulation to explain complex sequence

Statement of Verification

- P-36 Commission followed good modern practice
- Well qualified and had necessary resources & time
- Methodical approach
 - collect evidence, create hypotheses, test hypotheses, select event, rigorous accident investigation for direct and basic causes
- Numerous technical studies to support decision making
 - HAZOP, Gas dispersion, explosion, stability, F&G + ESD analysis
 - These were carried out to a high professional standard

Conclusion

- DNV consider that the P-36 Investigation findings as to cause most closely match the evidence.